

Effects of sociodemographic features and accompanying systemic diseases on urinary incontinence

Factors affecting urinary incontinence

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Abstract

Aim: The aim of this study is to determine the urinary incontinence (UI) subtype of women who present with complaints of urinary incontinence to our clinic, to identify risk factors related with this type and to determine the effects of sociodemographic features. **Material and Method:** This retrospective study was approved by Clinical Trials Ethics Committee in Malatya and included 386 patients who presented to Urology Clinic of Malatya Research and Education Hospital. Classification of the UI subtypes was performed using Turkish Version of International Incontinence Questionnaire-Short Form (ICIQ-SF) which was validated by Cetinel et al. Comorbidities and other data of the patients were evaluated by asking the patients. **Results:** The mean age of the patients was 51.4 years (range: 18-92 years). The mean number of births was 4.1 (range 0-10) and 90.2% of the women were married. The mean BMI was 27.24 kg/m². Stress urinary incontinence was found in 24 (6.3%) patients, urge type urinary incontinence was found in 94 (24.3%) patients and mixed type urinary incontinence was found in 268 (69.4) patients when the type of incontinence was questioned. From the comorbid diseases, diabetes mellitus was present in 74 patients (19,1%) while hypertension was present in 84 (21,8%) patients. There were statistically significant differences among UI and age and BMI. **Discussion:** Such diseases as diabetes mellitus, hypertension, lumbar disc hernia, and multiple sclerosis, birth trauma, past urogynecological surgery, age, BMI, and the number of births are risk factors for UI.

Keywords

Sociodemographic Features; Systemic Diseases; Female; Urinary Incontinence

DOI: 10.4328/JCAM.5916 Received: 30.05.2018 Accepted: 16.06.2018 Published Online: 19.06.2018 Printed: 01.05.2019 J Clin Anal Med 2019;10(3): 354-8
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Introduction

Urinary incontinence (UI) is a common social and pathological condition that has many negative impacts on quality of life. The International Continence Society and the International Society for Urogynecology have described UI as “an involuntary social and hygienic condition” [1]. Although the pathophysiology of the disease is still unclear, the pelvic floor muscles and the neurological structures regulating them may be responsible [2,3]. Rates ranging from 38% to 78% were determined in prevalence studies. The great difference between these rates is thought to be related to the variation in the definition of the disease and to the approach of the patients [4-6]. In some studies, urinary incontinence appears to be associated with age, lower education level, menopause, and multiparity [7-9]. Some of the patients with UI were found to have additional diseases such as osteoarthritis, peptic ulcer disease, cardiac disease, obesity, and diabetes mellitus [10-12]. UI causes not only physical but also social and sexual problems in women [13,14]. The aim of this study is to determine the urinary incontinence (UI) subtype of women who presented with complaints of urinary incontinence to our clinic, to identify risk factors related with this type and to determine the effects of sociodemographic features.

Material and Method

This retrospective study was approved by Clinical Trials Ethics Committee in Malatya and included 386 patients who presented to Urology Clinic of Malatya Research and Education Hospital. This study included patients who present with urinary incontinence at or above 18 years of age. Pregnant women were not included in the study because of the possibility of transient urinary incontinence. Classification of UI types was done using the Turkish version of the International Incontinence Questionnaire-Short Form (ICIQ-SF) [15]. Comorbidities and other data of the patients were evaluated by asking the patients. Age, marital status, number of births, UI type, earlier treatments, urinary incontinence period, the rate of cystometry for diagnosis, treatment type, parameters such as body mass index (BMI) (< 19.9 kg/m² underweight, 20 - 24.9 kg/m², normal weight, 25-29.9 kg/m² overweight, > 30 kg/m² obese), accompanying disease history (diabetes mellitus, hypertension, neurological disease (multiple sclerosis (MS), lumbar disc herniation (LDH), cerebrovascular disease), birth trauma and uro-gynecological surgical history were evaluated.

Statistical analysis

The data were analyzed using SPSS version 20.0 (SPSS Inc., Chicago, IL.) and IBM Modeler Professional 14.2 and for descriptive statistics number (percentage) and mean \pm SD was given. Normality of the distribution was confirmed with Kolmogorov-Smirnov test. One-way ANOVA test was used to compare UI types in numerical variables (BMI, number of births, duration of symptom). Multiple comparisons were made with Tamhane T2 test because of non-homogeneous variances. To compare UI types according to categorical variables (comorbidities such as marital status, diabetes mellitus, hypertension, neurological diseases, birth trauma and history of urogynecological surgery) Pearson's chi-square test with Bonferroni method was used. In addition, multinomial logistic regression analyzes were used to

relate the response variables to the predictors. $P < 0.05$ was considered to be significant.

Results

Interviews were made with 386 women whose data was full and who can be reached. Possible risk factors such as the mean age of the patients, marital status, number of births, body mass index, medical illness (DM, HT, neurological disease), gynecological surgery history, birth trauma, duration of incontinence before the admission (years), treatment for incontinence before the admission, type of incontinence, and frequency of incontinence are presented in Table 1 and Table 2. The mean age was 51.4 years (range: 18-92 years). The mean number of births was 4.1 (range 0-10) and 90.2% of the women were married. The mean BMI was 27.24 kg/m². Approximately 24.4% of the patients were seeking treatment for these complaints, and they admitted themselves. However, the remaining majority accepted it as a natural consequence of aging and had been brought or directed by others. The mean duration of urinary incontinence before the application was 22 months. Urinary incontinence occurred in 293 (75.9%) women during daytime and in 81 (20.9%) during the whole day (regardless of day and night). When the type of incontinence was questioned, stress urinary incontinence was found in 24 (6.3%) patients, urge type urinary incontinence was found in 94 (24.3%) patients and mixed type urinary incontinence was found in 268 (69.4) patients. From the comorbid diseases diabetes mellitus was present in 74 patients (19,1%) while hypertension was present in 84 (21,8%) patients. The number of previously treated patients was 287 (74.3%). Eight women with stress urinary incontinence were found to gain continence after surgical treatment. Factors associated with the onset of urinary incontinence were birth trauma ($n = 103$), urogynecologic surgery ($n = 61$) and history of lumbar disc herniation ($n = 24$). Multiple sclerosis ($n = 10$), coronary artery disease ($n = 14$), cerebrovascular disease ($n = 7$), chronic obstructive pulmonary disease ($n = 12$), migraine ($n = 6$), and epilepsy ($n = 1$) were also remarkable. There were statistically significant differences among UI and age and BMI. Significant variables according to the results obtained from multiple logistic regression analysis were age, BMI, gynecologic surgery, LDH, and MS ($p < 0.05$; Table 3).

Discussion

Urinary incontinence can be seen in various forms. The most common subtype in women is the stress urinary incontinence. In patients with stress-type incontinence, urinary incontinence may occur during exercise, during intraabdominal pressure-enhancing situations such as coughing, sneezing, laughing, or during any weightlifting [16]. Patients may therefore have to restrict their activities. Urge incontinence is another type of urinary incontinence in which urgency and incontinence while hurrying to toilette occur. It may occur during sleep, while drinking water or impulsive conditions like hearing the sound of water. This condition is also called spastic bladder, overactive bladder and reflex incontinence [17]. In some patients, these two types of urinary incontinence are seen together. This is called mixed type incontinence. Functional incontinence is defined as the presence of cognitive and physical problems and urinary

Table 1. Demographic characteristics of the study group.

Characteristic	Description	No	%
Age	18-29	26	4,6
	30-44	78	20,2
	≥45	282	75,2
Marital status	Married	348	90,2
	Single	38	9,8
Parity	0	24	6,3
	1	38	9,8
	2	60	15,6
	3	64	16,5
	4	66	17
	≥5	134	34,8
BMI	<25	58	15
	26-30	304	78,8
	>30	24	6,2

Table 2. Additional disease story and UI story of the study group.

Characteristic	Description	No	%
History of diabetes mellitus	Yes	74	19,1
	No	312	80,9
History of hypertension	Yes	84	21,8
	No	302	78,2
History of neurologic disease	Yes	42	10,7
	No	344	89,3
History of abdominal gynecologic surgery	Yes	61	15,9
	No	325	84,1
History of birth trauma	Yes	103	26,7
	No	283	73,3
Urinary leakage time (before presenting)	1 year	92	23,9
	≥1 year	294	76,1
Any treatment for UI before presenting	Yes	287	74,3
	No	99	25,7
Type of UI	Stress UI	24	6,3
	Urgency UI	94	24,3
	Mixt UI	268	69,4
UI time	All day	81	20,9
	Only daylight	293	75,9
	Only night	12	3,2

Table 3. The results of multiple logistic regression analyses of the potential risk factors of UI.

Variable	Estimate	SE	p value	OR	95 % CI for OR
Age	0.014	0.007	0.040	1.023	1.001-1.034
BMI	0.514	0.079	<0,001*	1.678	1.421-1.894
Gynecological surgery	1.211	0.386	0.002*	3.781	1.547-11.135
LDH	1.682	0.487	0.003*	5.648	1.808-17.871
MS	1.892	0.672	0.010	7.121	1.521-32.846
Marital status	0.689	0.279	0.050	0.425	0.216-1.024
Diabetes mellitus	0.512	0.318	0.75	1.674	0.919-3.142

BMI body mass index, UI urinary incontinence, LDH lumbar disc hernia, MS multiple sclerosis, SE standard error, OR odds ratios, CI confidence intervals * p<0.05 is statistically significant

incontinence occurs because the patient can't reach to toilette due to these problems [18].

A detailed history, urinary diary, and complete physical examination determine the type of urinary incontinence, thus it will help to diagnose the patient and to regulate the treatment. It is obvious that cultural and educational level in our region is worse than in the west. For this reason, the vast majority of the patients (75.6%) were not aware of the disease, whether it was treated or not, and were therefore directed to the hospital by others. In several previous studies the percentage of patients who seek treatment themselves was lower than in our study [19,20]. Cetinel et al. reported this rate as 12% [21].

Some of the patients, especially those in the elderly population, seem to accept this as a natural process of aging and consider that this is normal. This is closely related to the culture of the society.

Previous studies have reported that stress urinary incontinence was the most common subtype of urinary incontinence [22,23]. In our study, the most common urinary incontinence subtype was the mixed type (69.4%) followed by urge incontinence (24.3%) and stress incontinence (6.3%).

Prevalence of urinary incontinence was found to be less than 10% in previous studies. Urinary incontinence is more common in females than in males. Prevalence increases with age [24-26]. In our study, it was seen that the majority of all patients (75.2%) were at or above forty-five years of age. Only 4.6% of women were under thirty years of age. In the young age group, more urge incontinence was found, and as the age increases, stress type incontinence and mixed type replaced it. When all age groups were evaluated, the least prevalent incontinence type was found to be stress type incontinence. However, the majority of the patients with stress incontinence were found to be 45 years of age or older. The most common type of incontinence was found to be mixed type incontinence in all groups. When the literature is examined, the prevalence of stress incontinence in the elderly population was found to be close to 60%, whereas in our study this rate was found to be low compared to these studies [26,27].

In our study, the statistically significant difference was found between the UI types and the mean age. The mean age of the patients in the stress UI group was significantly lower than the other two types of UI. Although the majority of the patients included in the study were married, no significant association was found between the UI and the marital status.

Studies have shown that the increase in BMI increases the bladder pressure, thus the intra-abdominal pressure, which in turn increases urethral mobility and adversely, affects UI. An adverse effect of increased BMI is especially prominent in stress type UI [11,28,29]. In our study, the mean BMI of the patients was in the overweight range (304 patients, 78.8%). In accordance with the literature, BMI was higher in the stress incontinence subtype than the other UI subtypes. Many previous studies showed that incidence of urinary incontinence increases as the number of births increase. The frequency of UI was demonstrated to be higher in women who delivered 4 or more when compared to women who have never delivered. In another study, UI incidence was higher in women with 1 child than in women who have never delivered [30-32]. In our study, the mean number of births

of the patients was 3.54. In addition, the number of births and the frequency of UI was found to be proportional. Patients with stress UI had a lower number of births than other UI types. No significant difference could be found between UI types and the mean number of births ($p=0,3$).

The association between hypertension and UI has been reported in many studies [33]. When the relationship between systemic diseases and UI was evaluated, hypertension was found in 21.8% of patients. The most common systemic disease was hypertension. Hypertension was significantly more common in urge and mixed UI types ($p = 0.02$). This can be attributed to the fact that patients with urge and mixed types UI were mostly among the elderly population.

Diabetes mellitus and many neurological diseases lead to impairment of urinary retention mechanisms by various factors. In addition, these diseases may cause impairment in detrusor activity [7,10,34]. In our study, diabetes mellitus was detected in 74 patients (19,1%) and neurological diseases (multiple sclerosis, cerebrovascular disease) in 42 patients (10,7%). Patients diagnosed with diabetes mellitus and neurological disease were more likely to have urge and mixed type UI. There was no statistically significant difference between UI types.

The literature examination showed that many risk factors were found to be associated with UI [5,7,35]. In our study, birth trauma (103 cases; 26,7%), urogynecologic surgery (61 cases; 15,9%), and lumbar disc hernia were the other common comorbid diseases associated with UI. Although mixed type urinary incontinence was more frequent in those with these comorbidities, no significant difference was found between the other UI types. A small proportion of our patients had accompanying systemic disease.

Epidemiological studies have shown that menopausal status, multiple birth traumas, and obesity were significantly related with UI subtypes [5]. Age and BMI were statistically significant variables in comparison of risk factors and UI types ($p < 0,05$). In the present study, there are two limiting factors. First is its retrospective nature and second is a lack of a control group for comparison since it was not a prevalence study.

Conclusion

This study gives information about the factors that may be a risk factors for UI in women. In addition to diseases such as diabetes mellitus, hypertension, lumbar disc hernia, and multiple sclerosis, birth trauma, past urogynecological surgery, age, BMI, and number of births are risk factors for UI. Since the majority of the patients consider the UI as a natural consequence of aging, they often do not seek a medical help for this. Thus, the majority of the patients are brought to the clinic by a relative. In developing countries, patients should be informed in details about the UI and directed to the urologist for treatment. We also believe that more extensive prevalence studies should be done in this field to obtain more precise data.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: None

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

References

- Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. International Urogynecological Association; International Continence Society. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Neurourol Urodyn*. 2010; 29(1): 4-20.
- Padmanabhan P, Dmochowski R. Urinary incontinence in women: a comprehensive review of the pathophysiology, diagnosis and treatment. *Minerva Ginecol*. 2014; 66(5): 469-78.
- Kerns JM, Damaser MS, Kane JM, Sakamoto K, Benson JT, Shott S, et al. Effects of pudendal nerve injury in the female rat. *Neurourol Urodyn* 2000; 19(1): 53-69.
- Teixeira RV, Colla C, Sbruzzi G, Mallmann A, Paiva LL. Prevalence of urinary incontinence in female athletes: a systematic review with meta-analysis. *Int Urogynecol J*. 2018; (13). Doi: 10.1007/s00192-018-3651-1.
- Fiegen MM, Benson KD, Hanson JD, Prasek J, Hansen KA, VanEerden P. The prevalence of urinary incontinence in American Indian women from a South Dakota tribe. *Int Urogynecol J*. 2012; 23(4): 473-79.
- Adelmann PK. Prevalence and detection of urinary incontinence among older Medicaid recipients. *J Health Care Poor Underserved* 2004;15(1):99-112.
- Junqueira JB, Santos VLCG. Urinary incontinence in hospital patients: prevalence and associated factors. *Rev Lat Am Enfermagem*. 2018; (8)25. Doi: 10.1590/1518-8345.2139.2970.
- Thom D. Variation in estimates of urinary incontinence prevalence in the community: effects of differences in definition, population characteristics, and study type. *J Am Geriatr Soc*. 1998; 46(4): 473-80.
- Thomas TM, Plymat KR, Blannin J, Meade TW. Prevalence of urinary incontinence. *Br Med J*. 1980; 281(6250):1243-5.
- Furukawa S, Sakai T, Niiya T, Miyaoka H, Miyake T, Yamamoto S, et al. Macrovascular Complications and Prevalence of Urgency Incontinence in Japanese Patients with Type 2 Diabetes Mellitus: The Dogo Study. *Intern Med*. 2017; 56(8): 889-93.
- Tsai YC, Liu CH. Urinary incontinence among Taiwanese women: an outpatient study of prevalence, comorbidity, risk factors, and quality of life. *Int Urol Nephrol*. 2009; 41(4): 795-803.
- Lifford KL, Curhan GC, Hu FB, Barbieri RL, Grodstein F. Type 2 diabetes mellitus and risk of developing urinary incontinence. *J Am Geriatr Soc*. 2005; 53(11): 1851-7.
- Cameron AP, Smith AR, Lai HH, Bradley CS, Liu AB, Merion RM, et al. Bowel function, sexual function, and symptoms of pelvic organ prolapse in women with and without urinary incontinence. *Neurourol Urodyn*. 2018 (10). Doi: 10.1002/nau.23587.
- Al-Badr A, Brasha H, Al-Raddadi R, Noorwali F, Ross S. Prevalence of urinary incontinence among Saudi women. *Int J Gynaecol Obstet*. 2012; 117(2): 160-3.
- Cetinel B, Ozkan B, Can G. The validation study of ICIQSF Turkish version. *Turk J Urol*. 2004; 30: 332-8.
- Elshatanoufy S, Matthews A, Yousif M, Jamil M, Gutta S, Gill H, et al. Effect of Morbid Obesity on Midurethral Sling Efficacy for the Management of Stress Urinary Incontinence. *Female Pelvic Med Reconstr Surg*. 2018; (4). Doi: 10.1097/SPV.0000000000000594.
- Vo A, Kiehl SJ. Female Voiding Dysfunction and Urinary Incontinence. *Med Clin North Am*. 2018; 102(2): 313-24.
- Minagawa T, Gotoh M, Yokoyama O, Sugaya K, Yamanishi T, Kawahara K, et al. Therapeutic effect of propiverine hydrochloride on mixed-type urinary incontinence in women: The Female Urgency and Stress Urinary Incontinence Study of Propiverine Hydrochloride trial. *Int J Urol*. 2018; 25(5): 486-91.
- Koch LH. Help-seeking behaviors of women with urinary incontinence: an integrative literature review. *J Midwifery Womens Health*. 2006; 51(6): Doi: 10.1016/j.jmwh.2006.06.004.
- Kirkland VL, Palmer MH, Fitzgerald ST. Incontinence in a manufacturing setting: women's perceptions and responses. *Public Health Nurs*. 2001; 18(5): 312-17.
- Cetinel B, Demirkesen O, Tarcan T, Yalcin O, Kocak T, Senocak M, et al. Hidden female urinary incontinence in urology and obstetrics and gynecology outpatient

- clinics in Turkey: what are the determinants of bothersome urinary incontinence and helpseeking behavior? *Int Urogynecol J Pelvic Floor Dysfunct.* 2007; 18(6): 659–64.
22. Sharifiaghdas F, Mirzaei M, Daneshpajoo A, Narouie B. Long-term results of tension-free vaginal tape and pubovaginal sling in the treatment of stress urinary incontinence in female patients. *Clin Exp Obstet Gynecol.* 2017; 44(1): 44–7.
23. Lee KS, Sung HH, Na S, Choo MS. Prevalence of urinary incontinence in Korean women: results of a National Health Interview Survey. *World J Urol* 2008; 26(2): 179–85.
24. Valderrama-Hinds LM, Al Snih S, Chen NW, Rodriguez MA, Wong R. Falls in Mexican older adults aged 60 years and older. *Aging Clin Exp Res.* 2018; (17). Doi: 10.1007/s40520-018-0950-9.
25. Wetle T, Scherr P, Branch LG, Resnick NM, Harris T, Evans D et al. Difficulty with holding urine among older persons in a geographically defined community: prevalence and correlates. *J Am Geriatr Soc.* 1995; 43: 349–55.
26. Cheater FM, Castleden CM. Epidemiology and classification of urinary incontinence. *Bailliere Clin Obstet Gynecol.* 2000; 14: 183–205.
27. Burgio K, Matthews K, Engel B. Prevalence, incidence and correlates of urinary incontinence in healthy, middle aged women. *J Urol.* 1991; 146: 1255–9.
28. Zincir H, Demir G, Günaydin Y, Ozen B. Sexual Dysfunction in Married Women With Urinary Incontinence. *Urol J.* 2018; (7). Doi: 10.22037/uj.v0i0.4006.
29. Fenner DE, Trowbridge ER, Patel DA, Fultz NH, Miller JM, Howard D, et al. Establishing the Prevalence of Incontinence (EPI) study: racial differences in women's patterns of urinary incontinence. *J Urol.* 2008; 179(4): 1455–60.
30. Rocha J, Brandão P, Melo A, Torres S, Mota L, Costa F. Assessment of Urinary Incontinence in Pregnancy and Postpartum: Observational Study. *Acta Med Port.* 2017; 30(7-8): 568-72.
31. Bozkurt N, Ozkan S, Korucuoğlu U, Onan A, Aksakal N, İlhan M, et al. Urogenital symptoms of postmenopausal women in Turkey. *Menopause.* 2007; 14(1): 150–6.
32. Horng SS, Huang N, Wu SI, Fang YT, Chou YJ, Chou P. The epidemiology of urinary incontinence and its influence on quality of life in Taiwanese middle-aged women. *NeuroUrol Urodyn.* 2012; (12):1–6.
33. Tsui A, Kuh D, Cardozo L, Davis D. Vascular risk factors for male and female urgency urinary incontinence at age 68 years from a British birth cohort study. *BJU Int.* 2018; (7). Doi: 10.1111/bju.14137.
34. Arkan G, Beser A, Ozturk V. Experiences Related to Urinary Incontinence of Stroke Patients: A Qualitative Descriptive Study. *J Neurosci Nurs.* 2018; 50(1): 42-7.
35. van Almousa S, Bandin Loon A. The prevalence of urinary incontinence in nulliparous adolescent and middle-aged women and the associated risk factors: A systematic review. *Maturitas.* 2018; 107: 78-83.

How to cite this article:

Cimen S. *Effects of sociodemographic features and accompanying systemic diseases on urinary incontinence.* *J Clin Anal Med* 2019;10(3): 354-8.